

# DESIGN AND CONSTRUCTION GUIDELINES AND STANDARDS

DIVISION 33 • UTILITIES

## 33 36 00 • SEPTIC SYSTEMS

### SECTION INCLUDES

33 36 00 Septic Systems

### RELATED SECTIONS

31 00 00 Earthwork  
32 10 00 Paving  
33 00 00 Site Utilities  
32 90 00 Landscape  
22 00 00 Plumbing  
26 00 00 Electrical

### RESEARCH AND INVESTIGATION

Evaluate existing as-built information available from the Housing Authority. Verify that the as-built information does in fact represent the actual existing conditions. This should include a thorough examination of the site, documentation of all existing structures, rim elevations and any significant site features that may affect the design or be obstacles.

Locate all this information on a topographic plan which will serve as the base plan for the system replacement, or repair (as determined by the governing authority).

The topographical plan should show contour intervals of two (2) feet and spot grades as necessary.

If as-built information does not exist or is terribly inaccurate initiate the process to develop the needed documentation to prepare good contract documents.

Verify the electrical service at the site (single phase vs. 3 phase) and design accordingly.

Investigate soil and percolation conditions and groundwater levels prior to design. This will help to determine the size, capacity, and height above seasonal high groundwater of the septic system.

These soil tests must be performed by a Massachusetts DEP Licensed Soil Evaluator in accordance with the latest version of **310 CMR 15.000 (Title V)** in the presence of an official from the local Board of Health or a representative of the Massachusetts Department of Environmental Protection (DEP) and a representative from DHCD.

DHCD prefers test pits for performing this investigation but on some larger systems additional test borings may be necessary.

Tabulate the soil investigation on standard Title V soil evaluation sheets and submit them as part of the site investigation report.

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### DESIGN

Septic systems, whether they be new or upgraded, must be designed according to:

- the current edition of **310 CMR 15.000**; and
- any local regulations that supersede or replace **Title V**.

Design Systems using the following daily flow rates

<b>Family (Chapter 200 and 705)</b>	<b>110 gal/BR/day</b>
<b>Elderly (Chapter 667)</b>	<b>150 gal/BR/day</b>
<b>Special Needs (Chapter 167 and 689)</b>	<b>175 gal/BR/day</b>
	<b>(DMR guidelines)</b>

DEP has allowed the use of 2 times the actual water usage when calculating design flows. Using actual numbers, however, could result in requiring a larger system than the standards listed above.

The Designer should also do an analysis of the existing water usage in the development to determine if the LHA should consider water conservation measures such as low flow toilets or changes to the laundry equipment. Although the use of the conservation measures may not be considered in the design of the new or upgraded septic system they may have an impact on the longevity or efficiency of the new system.

Design Calculations and location of the water table should be well documented on the Contract Documents prior to bidding.

#### ***For flows less than 2,000 gallons/day.***

The standard, one-and-two family house, DHCD septic system consists of a septic tank of 1500 gallons capacity, distribution box and soil absorption system (SAS leaching area). Design the SAS or leaching area consistent with **310 CMR 15.240** and any additional local regulations.

#### ***For flows greater than 2,000 gallon/day.***

Title V requires a dosing system consisting of those items referenced above and a pump chamber and dual dosing pumps designed in accordance with the current edition of the DEP Dosing System Design Guidelines.

#### ***For flows greater than 10,000 gallons/day.***

A groundwater discharge permit and review will be required by the DEP Regional Office in which the Housing Authority is located. Most likely the designed system will employ innovative alternative (**I/A**) technology, such as FAST, BIOCLERE, and other DEP Approved **I/A** systems.

On Cape Cod, **I/A** systems are required to further remove any nitrates from the waste water flow regardless of the daily flow rate. These will also be designed using current **I/A** design methods and procedures.

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### MATERIALS

#### PUMPS AND CONTROLS

Design pumps for dosing and I/A systems in accordance with sections **15.229, 15.231, and 15.280 to 15.288** of Title V.

The standard pump system should be a duplex grinder pump system.

The pump controls and associated electrical connections will be designed by a Massachusetts Registered Mechanical and Electrical Engineer. This also includes any provisions for backup standby power.

It is strongly recommended that controls and panels be placed in some type of structure rather than being exposed to the exterior elements

#### PLAN REVIEW

Submittal to the reviewing and approving agency and any and all Town and State boards, agencies, and commissions will be required before final design approval is granted by DHCD. Changes, suggestions and comments must be incorporated into the final Contract Documents prior to issuance of the approval to bid.

Any conditions issued by these agencies should be incorporated into the bid documents.

### CONSTRUCTION

Title V requires the Designer ***MUST*** be present during certain phases of the septic construction. The Designer will certify that the system has been built in accordance with the plans and specifications and complies with Title V.

#### AS-BUILT DRAWINGS

All specifications should include a provision that requires the Contractor to provide a set of marked-up Contract Documents documenting the location of all of the new system components and the corresponding grades. These mark-ups will then be used by the Designer to prepare a set of certified as-built drawings of the system to be provided to the Town, the LHA and DHCD upon completion of the system and will show all system components and offsets to those components.